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The impact of hyped IPO's on the market

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THE IMPACT OF HYPED IPO'S ON THE MARKET

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Introduction

Increasingly, finance researchers are including irrationality into their understanding of the stock market, including emotions (Tetlock, 2007) or misunderstanding of available information (Huberman & Regev, 2007). The popularity of the recent Alibaba IPO demonstrates that investors can get excited.[1] Is excitement an important determinant of the behavior of stock market investors? Empirical evidence suggests that investors "herd" into similar stocks (Wermers, 1999) and may experience common feelings of optimism and pessimism (Tetlock, 2007). If investor's emotions correlate, what about excitement? Can the excitement for a particular stock spill over into the excitement of other stocks?

To analyze the impact excitement may have on investor's behavior, I analyze stock market returns around initial public offerings (IPOs). Much research has established three key features of stocks around their IPOs. First, the stock return on the IPO day is, on average, extremely positive. Second, the stock return of the IPO stock over a longer horizon tends to be lower than non-IPO stocks. Finally, higher first day stock returns are followed by higher trading volume. Taken together, Baker and Wurgler (2006) opine that these features may be the

[1]For More Details.
http://fortune.com/2014/09/10/alibabas-ipo-a-wall-street-fable/

result of excitement for the IPO stock. Can this excitement spill over to other stocks as well? One important feature of IPOs is that for every IPO with excitement like Alibaba or Facebook, there are dozens of other IPOs that do not spur the same level of excitement. To empirically measure excitement, I use query volume reports from *Google Trends* (http://www.google.com/trends/). *Google Trends* reports at a weekly granularity how often a search term is entered into the search engine. I argue that, on average, more queries means more excitement. Da, Engleberg, and Gao (2011) find evidence that supports this argument. Da et al. (2011) show that query volume from *Google Trends* for IPO stocks relate to higher first day IPO returns and lower subsequent returns. Baker and Wurgler (2006) relate this pattern (high first day returns and low subsequent returns) to excitement. Therefore, I argue that IPOs with high query volume have more excitement (that is, are "hyped") than IPOs with low volume (which I called "obscure").

My main hypothesis is not about the excitement surrounding individual stocks (this has been covered by Da, et al. (2011) previously), but rather how the excitement of an individual stock can spill over into the whole market. To measure the impact on other stocks, I analyze how excitement for an individual IPO stock relates to the entire stock market. My main

empirical test is to relate the *Google Trends* query volume of IPO stocks to the return and trading volume of the S&P 500 stock market index.

To test the hypothesis, I performed a t-test of market returns, by grouping the weekly S&P 500 returns and volume by the total IPO hype (*Google Trends* Search Volume). I find that, on average, returns and trade volume of the S&P 500 are higher during the weeks with large IPO hype. This difference, though, is not statistically significant.

The rest of the paper is structured as follows. The next section reviews the literature available on this topic. It serves as my motivation to perform this research. After the literature review the methodology will be explained in detail. Finally, the last two sections are the results and recommendations that came from this research.

Literature Review

Stock returns exhibit a well-known pattern around IPOs positive first-day returns and subsequent negative returns. These positive first-day returns are shown by Ritter (2002), Green and Hwang (2011), and many others. There are many potential explanations for these well-known patterns. For example, Ritter (2002) argues that asymmetric information is unlikely the cause for first day returns, which average 65%.

Ritter (2001) shows how IPOs underperform long-term when compared to stocks of the same size and industry over the same time period. Ritter (1998) relates the long-term underperformance with market optimism. Consequently, I will examine other factors, such as psychological or behavioral patterns.

Da, Engleberg, and Gao (2011) examine the relationship between IPOs first day returns and Search Volume Index (SVI) from *Google Trends.* In their analysis they find that increases in SVI lead to higher stock prices following the IPO date. An eventual price reversal occurs which Da, Engleberg, and Gao see as being predicted by the high SVI showing the over excitement.

Standard financial models have a difficulty explaining observed patterns in the stock market (Baker & Wurgler, 2007). Baker and Wurgler argue that investors are subject to sentiment. In a time of positive investor sentiment, for example, the prices of technology stocks tend to shoot up due to excitement. Investor sentiment could explain the first day returns of IPOs. For long-run negative returns, Ljungqvist (2006) shows that irrational investors lead to long-run underperformance of an IPO. As we can see, both of these phenomena, the short-term returns and long-term performance may be related to over excitement. My hypothesis examines the possible spill over of

excitement into the overall market. Given the potential psychological factors that affect individual traders, research suggests that the psychological factors affecting one trader may spill over to other traders.

Devenow and Welch (1996) study herding and define two views of herding: the rational and nonrational. Non rational herding is following other investors blindly. This occurs when one investor cannot make decisions on their own. Thus, relying on what other investors are doing. Wermers (1999) analyzes herding by mutual fund managers and discovers, that stocks bought by herds have current and future higher returns when compared to stocks sold by herds. Carhart (1997) shows that mutual fund returns can be explained by trend-chasing behavior.

I suspect investors' excitement for IPO stocks can spill over to the overall market. From the evidence of investor herding, the sentiment of one trader can spill over to other traders. Therefore, the excitement of IPO stock traders may spill over to the traders of the non-IPO stocks, causing an overall increase in market wide sentiment. Positive market-wide sentiment leads to higher returns (Baker and Wurgler, 2006). Given the findings of Da, et al. (2011), I can empirically measure this excitement and test my hypothesis.

Methodology

To test my hypothesis, I first obtain a list of Initial Public Offerings (IPOs) from the NASDAQ website.[2] Which listed all of the IPOs back to January 1997, on exchanges other than the NASDAQ exchange. NASDAQ reports the IPO stock's ticker, the market on which it trades, the opening price, the number of shares available, and the date of the IPO. I collect a sample of 2710 IPOs from the New York Stock Exchange, American Stock Exchange, Over the Counter Bulletin Board, Pink Sheets, and all the variations of the NASDAQ exchange.

To most precisely test my hypothesis, I filter several of these IPOs from my sample. *Google Trends* reports are only available back to January 2004. So, I exclude all IPOs before then. To focus on large, liquid, and relatively popular IPOs, I limit this study to IPOs on the large public markets, filtering out the IPOs that trade over-the-counter. This leaves the IPOs on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX), NASDAQ, and the NASDAQ Global Market. Finally, I filter out the IPOs whose ticker symbol are common words (e.g., fly, hire, news, too, face, club and tree, see Table 2 for a complete list of the deleted tickers). These words could skew the analysis since they had a large amount of queries relative to

[2] For more details.
http://www.nasdaq.com/markets/ipos/activity.aspx?tab=pricings

the more traditional tickers. These filters leave a sample of 1281 IPOs.

To measure excitement, I follow Da, et al. (2011) and use *Google Trends*. Essentially, for an entered search term and period of time (typically a week for a popular item), *Google Trends* will report the number of times the entered search term was queried as a proportion of all searches.[3] Following Da, et al. (2011), I enter the IPO stock's ticker symbol for the four-week period leading up the IPO date. *Google Trends* generates the query reports at a weekly granularity, so I average the four weekly search volume report values to calculate the four-week value. I call this average, the IPO's "hype." To get more precise reports, *Google Trends* allows users to filter their results. I use the following filters. I restrict the report to queries done within the United States. Further, I use the "finance" filter, which limits the queries to those done under the finance category.

Since *Google Trends* only builds reports for five search terms at a time, I construct a Visual Basic macro to partially automate the process of generating the report (see Table 1 for the macro). The macro creates links to the search report of a specified ticker for each week covered in the *Google Trends*

[3] For more details. https://support.google.com/trends/answer/4355213?hl=en&ref_topic=4365599

database. Essentially, the macro works off of the IPOs downloaded from the NASDAQ website, the macro will search and filter the data. For instance, the following link:

https://www.google.com/trends/explore#cat=0-7&q=fb&geo=US&cmpt=q&tz=

Will generate a report of the "fb" (the ticker for Facebook) search term for queries done within the United States and under the finance category for the ticker "fb". To change the report to "goog" (the ticker for Google) one only needs to change "fb" to "goog":

https://www.google.com/trends/explore#cat=0-7&q=goog&geo=US&cmpt=q&tz=

With this in mind, I was able to create a macro that would take five terms at a time and create a link to their reports. Thus, I only needed to search 400 times, which, with the macro, takes less than a minute.

Google Trends typically reports the search volume at a weekly granularity. When the volume is particularly low, *Google Trends* will provide the data in monthly granularity. If an IPO ticker report returned at a monthly granularity, I consider this the lowest level of excitement, considering its weekly search interest as zero.

My hypothesis is about total amount of excitement in the market and its relation to market returns. So, I need to convert the excitement or hype of the individual IPOs into a market-wide measure of total hype. To do this, for a given week, the market-wide hype is the sum of the hype of all of the IPOs that occur during that calendar week.

The data required to test my hypothesis is the weekly returns of the S&P 500. I choose a weekly granularity for the returns to match the weekly granularity of the *Google Trends* report. To construct returns, I need prices, which I get from *Yahoo Finance* (http://finance.yahoo.com/). *Yahoo Finance* reports adjusted closing prices at a weekly granularity, but they use a different definition of a week than *Google Trends*. *Google Trends* weekly reports end on Fridays, while *Yahoo Finance* weekly returns end on Mondays. As such, I downloaded daily adjusted closing prices and manually calculate weekly returns.

I merge the search reports to the weekly market returns in Excel. Since the data is weekly, I had to use a formula to get the year and week number. The formula used was the following: =year(X0&","&weeknum(X), where X is the date required. I used that formula in order to be able to get the previous four weeks leading up the IPO date. I had four rows with each one subtracting a week from the data that I had found previously.

That is how I was able to find the previous four weeks. Then using a Vlookup, I was able to match those four weeks to their corresponding search index. I then found the average of those four weeks to come up with a hype index for that IPO. See Table 3 for an example of the finished merged data.

Using the merged data, I calculate simple summary statistics for market-wide hype, S&P 500 returns, and trading volume. I compute the mean, median, standard deviation, skewness, Q1, and Q3 for these variables. I report these values in Panel A of Table 4.

My hypothesis is that when market-wide IPO hype is high, market returns and trading volume will be, on average, higher. As such, the simplest method to test this hypothesis is the t-test. This requires that I split the weeks of my sample into two subsamples: one with the significant market-wide IPO hype and one with only obscure IPOs. I need to empirically define "hyped" and "obscure." From the statistics reported in Panel A of Table 4, I see that the majority of IPOs have a search volume of 0 (Q3 is 0). As such, I define a week as having IPO hype if the total hype is non-zero. I calculate the same summary statistics for the two subsamples. I exclude any week from the sample that did not have an IPO. In Panel B of Table 4, I report the weeks with only obscure IPOs. In Panel C, I report the weeks which included

the hyped stocks. Finally, I perform t-tests of the market returns and trading volume for the two subsamples. I report the results in the next section and in Table 5.

Results

In Table 4, I report the summary statistics of the market-wide hype, weekly returns, and trading volume. The first panel included all the weeks which contain an IPO from my sample. Some of the summary statistics are very interesting. For instance, the market returns for all the IPOs have an average market return of 0.299%. Now, when I calculate the average market returns for the hype and non-hype weeks, I get 0.365% and 0.291%, respectively. This is 26% difference between the two. This supports my hypothesis because the weeks that contain IPOs with hype, on average did 0.074 better than the weeks with no IPO hype.

The same is true for the trading volume. When comparing the averages of the three panels, we see that on average the weeks with IPO hype tend to have more trading than the weeks that do not. The trading volume for weeks without IPO hype is 3.259 billion, while hyped weeks average 3.371 billion. This translates to a 3.42% increase from the weeks without hype.

In addition to this main evidence, I find other evidence supporting my hypothesis. Skewness of market returns is positive

during hyped IPO weeks. The full sample (Panel A) and the weeks without IPO hype (Panel B) have negative skewness. This seems like excitement and its spread may be driving the overall higher average return for weeks with IPO hype. The standard deviation of the two samples is of note. The standard deviation for the weeks with no IPO hype is 0.023 while it is 0.017 for the weeks with IPO hype. This tells me that the behavior of investors during weeks with IPO hype tends to have a more common behavior than those weeks when there is no hyped IPOs.

In Table 5, I report the results of my t-test of the returns and trading volume. When comparing the average market returns for the IPO hype and non IPO weeks, I calculate a p-value of 0.378, which suggests that there is not enough evidence to reject the null hypothesis that the average market returns are the same. Put another way, if the average return was truly the same during hype and non-hype weeks, I have a 37.77% chance to get a similar data set. Similar results were obtained when calculating the t-test and the p-value for trading volume. The subsequent results were 0.829 for the t-test and 0.283 for the p-value. As such, despite the fact that the average return and trading volume are higher when there is IPO hype, I cannot rule out that this is due to chance.

Conclusions and Recommendations

The goal of my research was to link the excitement of initial public offerings (IPOs) to the overall market. Previous research (Baker & Wurgler, 2006) argues that IPOs generate excitement and (Tetlock, 2007) that investor's emotions correlate. Therefore, I hypothesize that the excitement of IPOs spill over to the whole market. To test this hypothesis, I empirically measure IPO hype with the search volume on *Google Trends* (Da, et al., 2011). I find that, on average, S&P 500 returns and trading volume are higher during weeks with hyped IPOs. However, this difference is not statistically significant.

Further research should include other countries in my queries. I may understate the true hype by ignoring investors abroad. Further, research should more carefully identify how far the excitement may spill over. For example, perhaps the excitement of a technology IPO only spills over to other stocks in the technology sector.

Additionally, I make the following recommendations for anybody doing quantitative research. First, *Google Trends* is a powerful tool that shows the interest of people in real time. This has a large number of applications. The second one is to use programming and macros to automate the process to reduce the time of data collection.

Only a few people have ventured to use *Google Trends* in financial research. To the best of my knowledge, no one has measured the hype of one stock and analyzed its impact on the market. For those two reasons, this research will contribute to the IPO literature by analyzing a question not analyzed before.

Table 1

Macro used for creating links in *Google Trends.* This macro written in Visual Basic can be utilized to create links for search queries done within the United States under the finance category.

```
Sub Macro6()

' Macro6 Macro
' Keyboard Shortcut: Ctrl+t
Dim text2 As String
Dim text1 As String
Dim text3 As String
Dim text4 As String
Dim text5 As String
Dim i As Integer
Sheets("NASDAQ_NYSE").Select            ' "NASDAQ_NYSE" can be changed to sheet name
text1 = Range("b2")                     ' Term being searched is located in B2, can be
changed
text2 = Range("b3")                     ' Term being searched is located in B3, can be
changed
text3 = Range("b4")                     ' Term being searched is located in B4, can be
changed
text4 = Range("b5")                     ' Term being searched is located in B5, can be
changed
text5 = Range("b6")                     ' Term being searched is located in B6, can be
changed
                                        ' The term below puts the link in column "i6"
Range("i6") = "http://www.google.com/trends/explore#cat=0-7&q=" & text1 & "%2C%20" &
text2 & "%2C%20" & text3 & "%2C%20" & text4 & "%2C%20" & text5 & "&geo=US&cmpt=q&tz="
Range("a2:I6").Select                           ' Will select all your data from a2 t0
i6
Selection.Cut                           ' Will cut the data from that sheet
Sheets("Sheet1").Select                         ' Will go to another sheet in this case
"Sheet1"
 Range("A2").Select                     ' WIll select cell "a2"
  Cells(Rows.Count, 1).End(xlUp).Offset(1, 0).Select 'Will look for the next blank
cell in column a
    ActiveSheet.Paste                           ' Will paste range a2 to i6 in the next
blank cell
Sheets("NASDAQ_NYSE").Select            ' Goes back to the first sheet with all the
data
    Rows("2:6").Select                          ' Selects rows 2 to 6
    Range("A6").Activate
    Selection.Delete Shift:=xlUp                ' Will delete selection and shift up
the remaining
End Sub
```

Table 2

Table of deleted tickers. Using these tickers would not be appropriate since they are commonly searched terms in *Google Trends*. These tickers would have a high Search Volume Index and that would skew the data. Therefore, they had to be excluded from the sample.

Deleted Tickers								
acre	born	doc	fly	king	oak	sale	too	yelp
ally	box	earn	fuel	kors	oaks	salt	tour	zinc
alt	carb	echo	gaga	land	one	save	tree	
amc	chef	ever	game	leaf	path	semi	true	
avg	chip	exam	golf	lock	per	snow	tube	
away	club	eyes	gov	mack	rare	soda	type	
beat	corn	face	gram	mitt	rate	sol	voya	
blog	data	fire	hire	news	rice	stay	wage	
blue	date	fish	inn	nord	rue	tags	wifi	
body	deep	five	jazz	now	sage	tea	xoom	

Table 3

Table that meshes the S&P 500 weekly returns and the Hype for that given week.

Year	Week	YYYYWN	S&P Return	HYPED
2004	52	2004,52	1.296%	0
2004	51	2004,51	-0.374%	0
2004	50	2004,50	-0.189%	69.75
2004	49	2004,49	1.069%	0
2004	48	2004,48	0.460%	0
2004	47	2004,47	-1.138%	0
2004	46	2004,46	1.655%	0
2004	45	2004,45	3.154%	0
2004	44	2004,44	3.233%	39.5
2004	43	2004,43	-1.641%	0
2004	42	2004,42	-1.440%	0
2004	41	2004,41	-1.148%	0
2004	40	2004,40	2.536%	129
2004	39	2004,39	-1.077%	0
2004	38	2004,38	0.242%	0
2004	37	2004,37	0.234%	0
2004	36	2004,36	1.317%	0
2004	35	2004,35	1.103%	0
2004	34	2004,34	1.761%	0
2004	33	2004,33	-0.039%	0
2004	32	2004,32	-3.854%	0
2004	31	2004,31	1.628%	0
2004	30	2004,30	-1.335%	0
2004	29	2004,29	-1.163%	0
2004	28	2004,28	-0.305%	46
2004	27	2004,27	-0.703%	0
2004	26	2004,26	0.365%	0
2004	25	2004,25	0.865%	0
2004	24	2004,24	-0.346%	0
2004	23	2004,23	0.116%	0
2004	22	2004,22	2.307%	0
2004	21	2004,21	0.873%	0
2004	20	2004,20	0.789%	0
2004	19	2004,19	-1.681%	0
2004	18	2004,18	-2.486%	0
2004	17	2004,17	0.421%	14.25
2004	16	2004,16	-0.925%	0
2004	15	2004,15	-0.978%	0

Table 4

Panels composed of summary statistics. Panel A includes all the IPOs. Panel B only looks at the Obscure IPOs and Panel C looks at the Hyped IPOs. Each panel looks at the mean, median, standard deviation, skewness, Q1 and Q3. For three different sets of data. The first one being the hype values, then the S&P 500 returns and the trading volume statistics.

All

Panel A	Hype Statistics Filtered	Return Statistics Filtered	Volume Statistics Filtered (millions)
Mean	4.599	0.299	3.27E+03
Median	0.000	0.492	3.12E+03
St. Dev.	15.623	0.022	1.47E+03
Skew	3.797	-0.125	0.962
Q1	0.000	-0.008	2.27E+03
Q3	0.000	0.013	4.12E+03

Obscure

Panel B	Hype Statistics Filtered	Return Statistics Filtered	Volume Statistics Filtered (millions)
Mean	0	0.291	3.26E+03
Median	0	0.492	3.11E+03
St. Dev.	0	0.023	1.52E+03
Skew	0	-0.126	0.964
Q1	0	-0.008	2.17E+03
Q3	0	0.013	4.12E+03

Hype

Panel C	Hype Statistics Filtered	Return Statistics Filtered	Volume Statistics Filtered (millions)
Mean	39.861	0.365	3.37E+03
Median	39.375	0.724	3.27E+03
St. Dev.	26.764	0.017	1.00E+03
Skew	0.385	0.005	0.924
Q1	18.313	-0.005	2.52E+03
Q3	59.375	0.013	3.96E+03

Table 5

T-Test for S&P 500 returns .331 and P-Value .378. Results were not significant. Failed to reject the null hypothesis. The same is said for the T-Test and P-Value for the trading volume. T-Test .829 and P-Value .283, failed to reject the null hypothesis.

	S&P 500 Returns	
	Hype	**Obscure**
Mean	0.365	0.291
Variance	0.030	0.052
N	72	552
T-Test	**0.331**	
P-Value	**0.378**	
	Trading Volume	
	Hype	**Obscure**
Mean	3.371E+09	3.259E+09
Variance	1.001E+18	2.309E+18
N	72	552
T-Test	**0.829**	
P-Value	**0.283**	

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